

Purpose of study

At FPS, we want design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, our children will design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. They will acquire a broad range of subject knowledge and draw on learning from mathematics, science, engineering, computing and art. Children will learn how to take risks, become resourceful, innovative, enterprising and capable. Through the evaluation of past and present design and technology, they will develop a critical understanding of its impact on daily life and the wider world.

We want to ensure that all pupils:

- develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world**
- build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users**
- critique, evaluate and test their ideas and products and the work of others**
- understand and apply the principles of nutrition and learn how to cook.**

Contexts... imaginary, story-based, home, school, gardens, playgrounds, local community, history, industry and wider environment

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Designing	Understand users and purposes	<ul style="list-style-type: none"> say who their products are for Talk about how their products will work 	<ul style="list-style-type: none"> describe what their products are for say how their products will work say how they will make their products suitable for their intended users use simple design criteria to help develop their ideas 	<ul style="list-style-type: none"> describe what their products are for say how their products will work explain how particular parts of their products work use design criteria to shape their ideas 	<ul style="list-style-type: none"> explain how the features of their products will appeal to intended users explain how particular parts of their products work gather information about the needs and wants of particular individuals and groups develop their own simple design criteria and use these to shape their ideas 	<ul style="list-style-type: none"> describe the purpose of their products indicate the design features of their products that will appeal to the intended users explain how particular parts of their products work gather information about the needs and wants of particular individuals and groups develop a simple design specification to guide their thinking 	<ul style="list-style-type: none"> describe the purpose of their products indicate the design features of their products that will appeal to intended users explain how particular parts of their products work use market research to inform ideas develop a design specification to guide their thinking
	Ideas	<ul style="list-style-type: none"> Use own ideas to make something Test out some ideas and materials with support 	<ul style="list-style-type: none"> Use own experiences in their ideas draw ideas and explain why they have been chosen model ideas (try materials, parts and construction kits) make a templates and mock-ups 	<ul style="list-style-type: none"> design a product, how it looks and works think through ideas with someone else model ideas using prototypes and pattern pieces draw and label my design use ICT to design to develop and communicate their ideas 	<ul style="list-style-type: none"> share and clarify ideas through discussion model ideas using prototypes and pattern pieces use annotated sketches to develop and communicate ideas use ICT to design to develop and communicate their ideas 	<ul style="list-style-type: none"> share and clarify ideas through discussion model ideas using prototypes and pattern pieces use annotated sketches and cross-sectional drawings to develop and communicate their ideas use ICT to develop and communicate their ideas generate ideas drawn from research 	<ul style="list-style-type: none"> share and clarify ideas through discussion model ideas using prototypes and pattern pieces use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas use ICT to develop and communicate their ideas generate innovative ideas, drawing on research make design decisions, taking account of constraints such as time and resources
Making	Planning	<ul style="list-style-type: none"> Explain how they will make their product 	<ul style="list-style-type: none"> Choose tools and materials and explain why they have been chosen Make a simple plan before making 	<ul style="list-style-type: none"> select tools and equipment suitable for the task follow a step by step plan, choosing the right materials and tools 	<ul style="list-style-type: none"> explain their choice of tools and equipment in relation to the skills and techniques they will be using and the task Choose materials and components according to how they work and look order the main stages of making 	<ul style="list-style-type: none"> select tools and equipment suitable for the task explain their choice of tools and equipment in relation to the skills and techniques they will be using select materials and components suitable for the task explain their choice of materials and components according to functional properties and aesthetic qualities produce appropriate lists of tools, equipment and materials that they will need make step-by-step plans as a guide to making 	
	Practical skills and techniques	<ul style="list-style-type: none"> use scissors safely to cut around a marked line Make a product which moves Colour my finished product 	<ul style="list-style-type: none"> Join and combine materials in different ways Choose appropriate resources and tools safely measure, mark out, cut and shape materials use finishing techniques, including those from art and design <p>Food:</p> <ul style="list-style-type: none"> how to prepare simple dishes safely and hygienically without heat how to use techniques such as cutting, peeling and grating 	<ul style="list-style-type: none"> follow procedures for safety and hygiene use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components measure, mark out, cut and shape materials and components with some accuracy assemble, join and combine materials and components with some accuracy apply a range of finishing techniques, including those from art and design, with some accuracy <p>Food:</p> <ul style="list-style-type: none"> prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking. 	<ul style="list-style-type: none"> explain their choice of tools and equipment in relation to the skills and techniques they will be using and the task Choose materials and components according to how they work and look order the main stages of making 	<ul style="list-style-type: none"> follow procedures for safety and hygiene use a wider range of materials and components, including construction materials and kits, textiles, food ingredients, mechanical components accurately measure, mark out, cut and shape materials and components accurately assemble, join and combine materials and components accurately apply a range of finishing techniques, including those from art and design use techniques that involve a number of steps demonstrate resourcefulness when tackling practical tasks <p>Food:</p> <ul style="list-style-type: none"> how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking adapt recipes to change the appearance, taste, texture and aroma 	
Evaluating	Own ideas and products	<ul style="list-style-type: none"> talk about their design ideas and what they are making Say if their idea worked 	<ul style="list-style-type: none"> make simple judgements about their products and ideas against design criteria suggest how their products could be improved 	<ul style="list-style-type: none"> Show how their final product meets the design criteria Explain what went well and what they would change in their final design 	<ul style="list-style-type: none"> explain what went well and what they would change use design criteria as they design and make use their design criteria to evaluate their completed products explain how they improved their original design 	<ul style="list-style-type: none"> identify the strengths and areas for development in their ideas and products consider the views of others, including intended users critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make evaluate their ideas and products against their original design specification 	
	Investigating existing products	<ul style="list-style-type: none"> who are they for? what are they for? how does it work? how and where are they used what materials is it made from? what do you like and dislike about it? 		<ul style="list-style-type: none"> how well have products been designed and made? why have those materials been chosen? what methods of construction have been used? how well do they work and achieve their purposes and meet user needs and wants? <p>Investigate and analyse:</p> <ul style="list-style-type: none"> where products were designed and made when products were designed and made whether products can be recycled or reused 		<ul style="list-style-type: none"> how well have products been designed and made? why have those materials been chosen? what methods of construction have been used? how well do they work and achieve their purposes and meet user needs and wants? <p>Investigate and analyse:</p> <ul style="list-style-type: none"> how much products cost to make how innovative products are how sustainable the materials in products are what impact products have beyond their intended purpose 	

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Technical knowledge	Products	<ul style="list-style-type: none"> Know simple properties of materials 	<ul style="list-style-type: none"> Know characteristics of materials and components that a 3-D textiles product can be assembled from two identical fabric shapes about the movement of simple mechanisms such as levers, sliders, wheels and axles 	<ul style="list-style-type: none"> that materials have both functional properties and aesthetic qualities that a single fabric shape can be used to make a 3D textiles product Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products 	<ul style="list-style-type: none"> Use learning from science and maths helps design and make products that work Know materials can be combined and mixed to create more useful characteristics Know how simple electrical circuits and components can be used to create functional products Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products 	<ul style="list-style-type: none"> Apply learning from science and maths to help design and make products that work that materials have both functional properties and aesthetic qualities that materials can be combined and mixed to create more useful characteristics how to program a computer to monitor changes in the environment and control their products that a recipe can be adapted by adding or substituting one or more ingredients Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products that a 3D textiles product can be made from a combination of fabric shapes 	
	Structure	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Know how to make structures stronger, stiffer and more stable 	<ul style="list-style-type: none"> how to make strong, stiff shell structures 	<ul style="list-style-type: none"> how to make strong, stiff shell structures 	<ul style="list-style-type: none"> how to reinforce and strengthen a 3D framework (eg triangulation, Jinx Joints, cross beams) 	
	Mechanism	<ul style="list-style-type: none"> Know how to make part of a model move (slider, wheels) 	<ul style="list-style-type: none"> Know how to make a model move using simple mechanisms such as levers, sliders, wheels and axles 	<ul style="list-style-type: none"> how mechanical systems such as levers and linkages create movement 	<ul style="list-style-type: none"> how mechanical systems such as levers and linkages or pneumatic systems create movement 	<ul style="list-style-type: none"> how mechanical systems such as cams or pulleys or gears create movement that mechanical and electrical systems have an input, process and output 	
	Food	<ul style="list-style-type: none"> that all food comes from plants or animals that everyone should eat at least five portions of fruit and vegetables every day 	<ul style="list-style-type: none"> know that food has to be farmed, grown elsewhere (e.g. home) or caught that food ingredients should be combined according to their sensory characteristics how to name and sort foods into the five groups in The Eatwell plate 	<ul style="list-style-type: none"> know that food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world. know that seasons may affect the food available know how food is processed into ingredients that can be eaten or used in cooking that food ingredients can be fresh, pre-cooked and processed know that a healthy diet is made up from a variety and balance of different food and drink, as depicted in the Eatwell plate that to be active and healthy, food and drink are needed to provide energy for the body 	<ul style="list-style-type: none"> Know that seasons may affect the food available Know how food is processed into ingredients that can be eaten or used in cooking Know the environmental impact of food and food miles that different food and drink contain different substances – nutrients, water and fibre – that are needed for health 		

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Vocabulary	Design process	<ul style="list-style-type: none"> design, make, evaluate, user, ideas, product, function, features, 	<ul style="list-style-type: none"> purpose, design criteria, function, suitable 	<ul style="list-style-type: none"> prototype, innovative, appealing, design brief, research, evaluate, ideas, constraints, investigate model, annotated sketch, functional, aesthetics, function, 		<ul style="list-style-type: none"> functionality, authentic, user, market research annotated sketches, exploded diagrams 	
	Mechanisms	<ul style="list-style-type: none"> slider, lever, pivot, slot, bridge/guide card, masking tape, paper fastener, join 	<p>Wheels and axels:</p> <ul style="list-style-type: none"> vehicle, wheel, axle, axle holder, chassis, body, cab assembling, cutting, joining, shaping, finishing, fixed, free, moving, mechanism 	<p>Pneumatics:</p> <ul style="list-style-type: none"> components, attaching, tubing, syringe, plunger, split pin, pneumatic system, input movement, process, output movement, control, compression, pressure, inflate, deflate, pump, seal, air-tight linear, rotary, oscillating, reciprocating (motion) <p>Electrical circuits</p> <ul style="list-style-type: none"> series circuit, fault, connection, toggle switch, push-to-make switch, push-to-break switch, battery, battery holder, bulb, bulb holder, wire, insulator, conductor, crocodile clip control, program, system, input device, output device 		<p>Cams:</p> <ul style="list-style-type: none"> cam, snail cam, off-centre cam, peg cam, pear shaped cam follower, axle, shaft, crank, handle, housing, framework rotation, rotary motion, oscillating motion, reciprocating motion mechanical system, input movement, process, output movement <p>electrical circuits:</p> <ul style="list-style-type: none"> series circuit, parallel circuit, names of switches and components, input device, output device, system, monitor, control, program, flowchart 	
	structures	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> structure, wall, tower, framework, weak, strong, base, top, underneath, side, edge, surface, corner, point thinner, thicker, straight, curved metal, wood, plastic 	<ul style="list-style-type: none"> shell structure, three-dimensional (3-D) shape, net, cube, cuboid, prism, vertex, edge, face, length, width, breadth, capacity marking out, scoring, shaping, tabs, adhesives, joining, assemble, stiff, strong, corrugating, ribbing, laminating 		<ul style="list-style-type: none"> frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent 	
	textiles	<ul style="list-style-type: none"> thread, pins, needles, staplers, staples, fabric glue, template, pattern pieces, mark out, join, decorate, finish 		<ul style="list-style-type: none"> fabric, fastening, compartment, zip, button, structure, finishing technique, strength, weakness, stiffening, templates, stitch, seam, seam allowance, pattern pieces 		<ul style="list-style-type: none"> seam, seam allowance, wadding, reinforce, right side, wrong side, hem, template, pattern pieces pins, needles, thread, pinking shears, iron transfer paper mock-up, prototype 	
	Food	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> fruit and vegetable names, names of equipment and utensils sensory vocabulary e.g. soft, juicy, crunchy, sweet, sticky, smooth, sharp, crisp, sour, hard flesh, skin, seed, pip, core, slicing, peeling, cutting, squeezing, healthy diet, ingredients, arranging, 	<ul style="list-style-type: none"> name of products, names of equipment, utensils, techniques and ingredients texture, taste, sweet, sour, hot, spicy, appearance, smell, preference, greasy, moist, cook, fresh, savoury, sensory evaluations hygienic, edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested healthy/varied diet 		<ul style="list-style-type: none"> ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda, spice, herbs fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy, allergy, intolerance, savoury, source, seasonality utensils, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble 	